

Claims

- [c1] A process of selectively removing layers of a coating system from a surface of a component, the coating system comprising an inner coating layer and an outer coating layer that has the same composition as the inner coating layer but is less dense than the inner coating layer, the method comprising the step of directing a jet of liquid at the component to remove the outer coating layer without removing the inner coating layer.
- [c2] A process according to claim 1, wherein the inner and outer coating layers have different microstructures.
- [c3] A process according to claim 1, wherein the jet is emitted from a nozzle at a pressure of at least 2800 bar.
- [c4] A process according to claim 3, wherein the jet is emitted from the nozzle at an angle of about 30 to about 90 degrees to the surface of the component.
- [c5] A process according to claim 3, wherein the pressure of the jet is about 3500 bar and the jet is emitted from the nozzle at an angle of about ninety degrees to the surface of the component.
- [c6] A process according to claim 1, wherein the jet is directed at the component with an apparatus that substantially maintains the angle of the jet to the surface of the component.

- [c7] A process according to claim 1, wherein the coating system is a thermal barrier coating system and further comprises on the outer coating layer a ceramic topcoat having vertical cracks therethrough, the inner and outer coating layers are inner and outer metallic bond coat layers, respectively, and the jet is directed at the component to simultaneously remove the topcoat and the outer metallic bond coat layer without removing the inner metallic bond coat layer.
- [c8] A process according to claim 7, wherein the jet roughens the surface of the inner metallic bond coat layer.
- [c9] A process according to claim 7, further comprising the step of depositing the inner metallic bond coat layer by a high-velocity oxy-fuel process.
- [c10] A process according to claim 7, further comprising the step of depositing the outer metallic bond coat layer by a plasma spray process.
- [c11] A process according to claim 7, wherein the compositions of the inner and outer metallic bond coat layers are $M\text{CrAlY}$, where M is selected from the group consisting of iron, cobalt, nickel, and mixtures thereof.
- [c12] A process according to claim 7, further comprising the step of depositing the ceramic topcoat by a plasma spray process.

- [c13] A process according to claim 12, wherein the ceramic topcoat has a tensile strength of at least about 280 bar.
- [c14] A process according to claim 1, wherein the component is a component of a gas turbine engine.
- [c15] A process of selectively removing layers of a thermal barrier coating system from a surface of a gas turbine engine component, the thermal barrier coating system comprising an inner metallic bond coat layer deposited by a high-velocity oxy-fuel process, an outer metallic bond coat layer deposited by a plasma spray process so as to be less dense than the inner metallic bond coat layer, and a ceramic topcoat deposited by a plasma spray process to have vertical cracks and a tensile strength of at least about 280 bar, the method comprising the step of directing a jet of liquid at the component to simultaneously remove the topcoat and the outer metallic bond coat layer without removing the inner metallic bond coat layer, the jet being emitted from a nozzle at a pressure of at least 3100 bar and at an angle of about 45 to about 90 degrees to the surface of the component, the jet being directed at the component with an apparatus that substantially maintains the angle of the jet to the surface of the component.
- [c16] A process according to claim 15, wherein the liquid is water.
- [c17] A process according to claim 15, wherein the pressure of the

jet is about 3100 to about 3800 bar.

- [c18] A process according to claim 15, wherein the pressure of the jet is about 3500 bar and the jet is emitted from the nozzle at an angle of about ninety degrees to the surface of the component.
- [c19] A process according to claim 15, wherein the inner and outer metallic bond coat layers have the same composition formed of MCrAlY, where M is selected from the group consisting of iron, cobalt, nickel and mixtures thereof.
- [c20] A process according to claim 15, wherein the ceramic topcoat has a tensile strength of about 410 bar to about 800 bar.
- [c21] A process according to claim 15, wherein the jet roughens the surface of the inner metallic bond coat layer.
- [c22] A process according to claim 15, wherein the component is a gas turbine engine component.